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Book Reviews

GENERAL

Issues in Evolution. SOL TAX and CHARLES CALLENDER (Eds.) (The University of Chicago Centennial Discussions.) (Volume 3 of *Evolution after Darwin.*) Chicago: The University of Chicago Press, 1960. viii, 310 pp., index, 12 plates. \$7.50.

Reviewed by FREDRIK BARTH, *University of Bergen*

This is the third and final volume emerging from the University of Chicago Centennial Celebration of the publication of Darwin's "Origin of Species," and is primarily a record of the celebration itself. It presents the transcripts of five panel discussions, held by leading scholars from various physical, biological, and humane sciences, on the topics "The Origin of Life," "The Evolution of Life," "Man as an Organism," "The Evolution of Mind," and "Social and Cultural Evolution." In addition, it contains a group of three papers on "Evolution and Religion," Sir Julian Huxley's convocation address, and some subsequent commentaries and conclusions to the panel discussions, as well as a short history of the celebration program and an index to all three volumes.

The panel discussions are heralded by their organizers as the central feature of the Centennial Celebration Program; they are meant to summarize and synthesize the growth of knowledge on evolution during the last hundred years, and to mark a new turn in our history of "understanding ourselves and our cosmos." Such repeated assertions, as well as the eminence of the participants, cannot but raise one's level of expectations. However, in my opinion, the book fails to satisfy the highest standards, and it seems highly worthwhile to explore some of the nature, and perhaps causes, of its shortcomings.

It is no doubt unfortunate that the editors have chosen to include various papers of marginal significance in this concluding volume. It opens with a learned discussion of speculations on creation and evolution in classical Chinese philosophy and two papers which can only be characterized as Christian apologies, from a Catholic and a Protestant point of view. Though particularly Father Ewing's paper is tidy and well argued, they hardly represent "the most comprehensive and intensive examination ever made of the impact of Darwin's ideas" which the blurb promises us; and though the theological imbalance is partly corrected by Huxley's convocation address on "The Evolutionary Vision," his ideological commitment is perhaps too prominent to permit an authoritative examination of this impact. The concluding volume thus leaves unanswered the important problem, touched on by several of the discussants, of precisely why the concept of evolution should have such a shattering effect on contemporary religious thought as well as on Darwin's private belief, nor does it analyze for us what are the basic moral and philosophical implications of evolution, or the characteristic features of a pre-evolutionary world view. Likewise, Tax's disarming chronicle of the joys and disappointments of a Centennial Celebration Organizer hardly blends harmoniously with the pretensions of the other chapters.

However, these are mere editorial quibbles compared to the issue raised by the failure of the main part of the book: the summary and synthesis of 100 years of evolutionary thinking. Huxley characterizes Darwin's great contributions as, first, gathering a mass of detailed facts that cannot be understood except in terms of evolution, and

second, discovering the principle of natural selection as the mechanism of evolution. What view do the panel discussions give us of the continuation of this work?

It is not that the discussions are not concerned with interesting and important issues. On the face of it, the organization of the panels and allocation of themes between them seem eminently sensible. Panel 1 treats the fascinating problems of the origin of living things from nonliving matter in a discussion which is rather technical, yet fully accessible to the nonspecialist. Since there is essentially no direct evidence, the discussion bases itself mainly on general astronomy, geochemistry, and biochemistry. The confident use of deductive reasoning by these scientists in what might be called "conjectural history" is a lesson to anthropologists, particularly as one observes the extent of agreement which can be established between conclusions based on differing kinds of evidence and techniques, and the healthy, explicit disagreements that are debated—so different from the use of innuendo in some of the later panels. As one participant comments, any such discussion would have been unthinkable in Darwin's time, and virtually impossible only 20 years ago—a whole new phase of the history of the transformation of matter has been added and forms a fitting opening theme.

Panel 2 on the evolution of life covers the ground which was central to *The Origin of Species* and gives an interesting illustration of how the dominant role in theory-building has passed out of the hands of anatomists and ecologists like Darwin and into those of geneticists without the naturalist's orientation. This has created new problems, e.g., on the meaning of "fitness," which is faced squarely in an important series of comments. By the geneticist's strict operational definition, degree of fitness expresses a gene's relative frequency in a population over time: if a gene increases its share in the gene pool of a species, its fitness is above par. However, a variant that flourishes at the expense of others of its own species may continue to displace the latter, while lowering the reproductive rate of the species as a whole, perhaps to the point of collapse. The "fitness" of a form to its environment, which so delighted the naturalist in Darwin, appears to be a mixed function, where the different variables all relate to adaptation, survival, and change. The panel performs an important service in showing the need both for conceptual and empirical clarification of the role of selection in relation to animal aggregations, societies, and ecosystems, not merely in the framework of a hierarchy of gene-population-species. Otherwise, the discussion appears somewhat desultory, and particularly the paleontologists' contribution—so brilliantly popularized in recent writings—fails to come through.

Panel 3 is concerned with the descent of man, and reveals one of the weaknesses of the book by its failure to tie up to the main conclusions of the previous panel—or perhaps by demonstrating how the previous panel fails to provide such conclusions. While one participant wishes to reconstruct human evolution by utilizing various laws of phylogeny (which the previous panel failed to establish), most participants are content to speak in terms of rather conventional physical anthropology, meanwhile clarifying contemporary positions on questions such as brachiation and the concept of pedomorphism. Others discuss new data, such as Leakey's African finds and the absolute chronologies of the Pleistocene based on deep sea cores—the latter, however, of debatable status. Finally, the geneticist Waddington presents the notion that culture, and particularly writing, accelerates evolution by representing a new "socio-genetic" mechanism for transmitting adaptations, but that this mechanism presupposes receptivity in the form of acceptance of authority—an idea which seems to me in the latter parts of the book to receive rather greater acclaim than its originality merits.

In panel 4 the bridge between human and animal behavior is explored—a field where

evolutionary viewpoints become rather restricted by the lack of time depth, and where methodological difficulties of objectivity and the problem of ascribing "awareness" arise and are discussed.

Finally, panel 5 sees culture in an evolutionary perspective; and, in view of some present currents in American anthropology, should be of particular interest to anthropologists. This discussion, however, exhibits the weaknesses of the panel in extreme form: a frequent failure of communication and genuine debate, an undue concentration of the discussion on a few partly peripheral topics, and a persistence of misconceptions clarified by previous panel discussions, all contributing to the failure to provide any coherent systematic summary and synthesis. Kluckhohn may have anticipated and explained this when, in his opening statement, he raised the vexing question whether the concepts of contemporary anthropology are adequate for valid analysis. At any rate, the necessary components of any theory of cultural evolution are not provided. Phylogenies are discussed, though the significant properties of the entities involved (presumably "cultures") have not been clarified. Darwin's thesis had to be based on a clear conceptualization of individuals, species, breeding potentials, and food webs; likewise the contribution of genetics to evolutionary theory depends on particular conceptual refinements, such as viewing the population as a gene pool. Though current anthropological literature may not provide an analogous clarification of the properties, structure, and boundaries of cultures, one might have expected the panel at least to emphasize how necessary this is to any study of cultural evolution.

Perhaps because it fails to establish such a point of departure, the discussion contains contradictory and unresolved views on the crucial question of the mechanism of cultural change. An assertion of similarity between the mechanism of biological and cultural evolution is authoritatively contradicted by Huxley, for one thing because in culture there is no difference between ontogeny and phylogeny, or more tersely, germ plasma and soma are indistinguishable. Yet the panel speaks loosely about the competition for survival among ideas, social systems, and types of cultures, and comments on how new "types" in culture will increase and spread if successful—without reference to the important specifications of kinds of "fitness" and selection made in panel 2. The claim is also made that cultural evolution is at least in part deliberate, and this is elaborated in Huxley's convocation address in terms of our obligation to exercise our responsibility for future evolution rightly. Though the idea that we are responsible for our future evolution in a way which *Brontosaurus* was not may be disturbing or comforting according to one's viewpoint, it hardly agrees with Hallowell's interesting suggestion in panel 4, that values are a kind of summation of socio-cultural systems which permit the individual to become identified with his culture—rather as self-awareness may function for an organism. The inconsistency is only made explicit in a comment submitted by Steward after the discussion, pointing out that planning for the future must be based on shared goals, and one must assume that goals, no less than other aspects of culture, have determinate causes, which it may be our job as students of cultural evolution to isolate, but which imply limits on man's effective freedom to determine the course of his evolution not dissimilar to those of other life forms. Rather understandably, on such weak foundations, the panel can proceed to do little more than characterize descriptively the particular course of man's known history and pre-history, and reflect some interesting value conflicts on the topics of eugenics and world population problems.

When one considers the composite nature of the panels and the consequent variety of uncoordinated fact and opinion represented in its articles, discussions, and speeches,

it is not surprising that the book becomes difficult to assimilate. The clarification, the systematic ordering of concepts and data that one looks for in a summary and synthesis do not emerge. Furthermore, the confusion seems to me increased by two additional failures. Firstly, ambiguities in the very word "evolution" are permitted to permeate the discussion—prominent participants oscillate between the extremes of including all forms of transformation ("the evolution of the stars") to restricting and characterizing evolution as an irreversible process, leading to diversification and higher degrees of organization—on a cosmic scale, currents of both increasing and decreasing entropy. Secondly, the main lesson of Darwin's *Origin of Species* is not heeded: that it is through the discovery of the specific *mechanism*, not the mere *fact* of change, that evolutionary thinking becomes effective.

Clearly, if I am right in identifying these faults in the book, it cannot in any way reflect the quality of the participants; nor, as I have said, does the thematic organization seem seriously amiss. Yet the reasons for the failure may not be so far to seek. Tax can rightly claim that "never before have so many minds from so many diverse specialties been put so intensively to such a task." Equally truly one can say that never before have they been asked to work in the midst of so formidable a show of the impediments of American culture. To the whirr of TV-cameras, interrupted by commercials, in an overpacked mammoth audience hall, together with persons of the most divergent training as well as with some old friends and opponents, working against a deadline, they are asked to perform the impossible feat of thinking fast and originally on large, complex problems in a form fit to print. These are hardly conditions under which scholarship can flourish. Perhaps the "Introduction" to Darwin's *Origin of Species* contains a lesson as important to modern scholars as his main text. He writes: "When on board H.M.S. 'Beagle,' as naturalist, I was much struck with certain facts . . . (which) . . . seemed to throw some light on the origin of species. . . . On my return home, it occurred to me, in 1837, that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it. After five years' work I allowed myself to speculate on the subject, and drew up some short notes; these I enlarged in 1844 into a sketch of the conclusions, which then seemed to me probable: from that period to the present day I have steadily pursued the same object."

City Invincible. CARL H. KRAELING and ROBERT M. ADAMS (Eds.) (A Symposium on Urbanization and Cultural Development in the Ancient Near East held at the Oriental Institute of the University of Chicago, December 4-7, 1958.) Chicago: The University of Chicago Press, 1960, xiv, 450 pp., 1 chart, frontispiece, 2 maps. \$6.00.

Reviewed by JULIAN H. STEWARD, *University of Illinois and Center for Advanced Studies in the Behavioral Sciences*

Some three decades ago, Near East studies were primarily humanistic and historical. They were concerned with the peaks of cultural achievement in art, palace and temple architecture, writing, literature, religious ideology, and political institutions of the ancient, literate civilizations. The few dirt archeologists who worked in the Near East dealt with the unglamorous, simple origins of civilization.

In *City Invincible*, the Oriental Institute's symposium on the origins and development of civilized societies and cities in the Near East, 50 scholars, representing the natural sciences, social sciences, and humanities assembled for discussion. While the Near East specialists were expectably most numerous, other disciplines were sub-